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(56) Documents Cited:
GB 2375690 A GB 2372911 A
GB 2370196 A GB 2363037 A
GB 2358987 A GB 2323245 A
EP 1098489 A2 WO 1995/029568 A1
US 20020142792 A1

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(54) Abstract Title: User defined operating modes

(57) A mobile terminal for use in a mobile communications network is adapted to allow a user to define one or more modes of operation, where each mode of operation comprises predefined network settings or a combination of network and terminal settings. Network settings are those implemented by the service provider, e.g. call diversion to voice mail, call barring, call holding, access to caller or cell id, etc. and terminal settings are those concerning the terminal, e.g. call or SMS alert modes, ring tone volume etc. A mode may be switched manually or automatically in response to detection of a specific condition, e.g. a location condition (fig 4), time condition (fig 3) and/or a condition related to scheduled calendar events (fig 7), etc. The switching condition may be changed even whilst in the particular mode, e.g. extending a time condition for an overrunning event 119. A preferred embodiment comprises a sleep mode, e.g. for meetings, with silent alerts for calls and SMS reception 109 and call diversion to voicemail when call unanswered 107. The invention enables phone modes to be set easily and can provide a silent mode in which a user is provided with caller information 129 and a caller is made aware that the call cannot be taken at present.

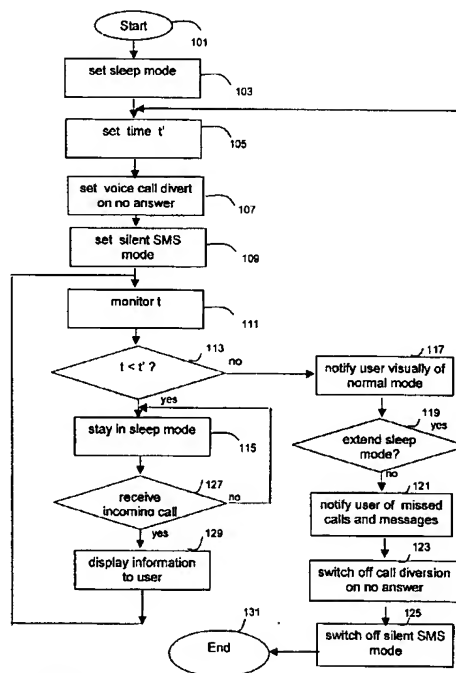


Fig. 3

1/6

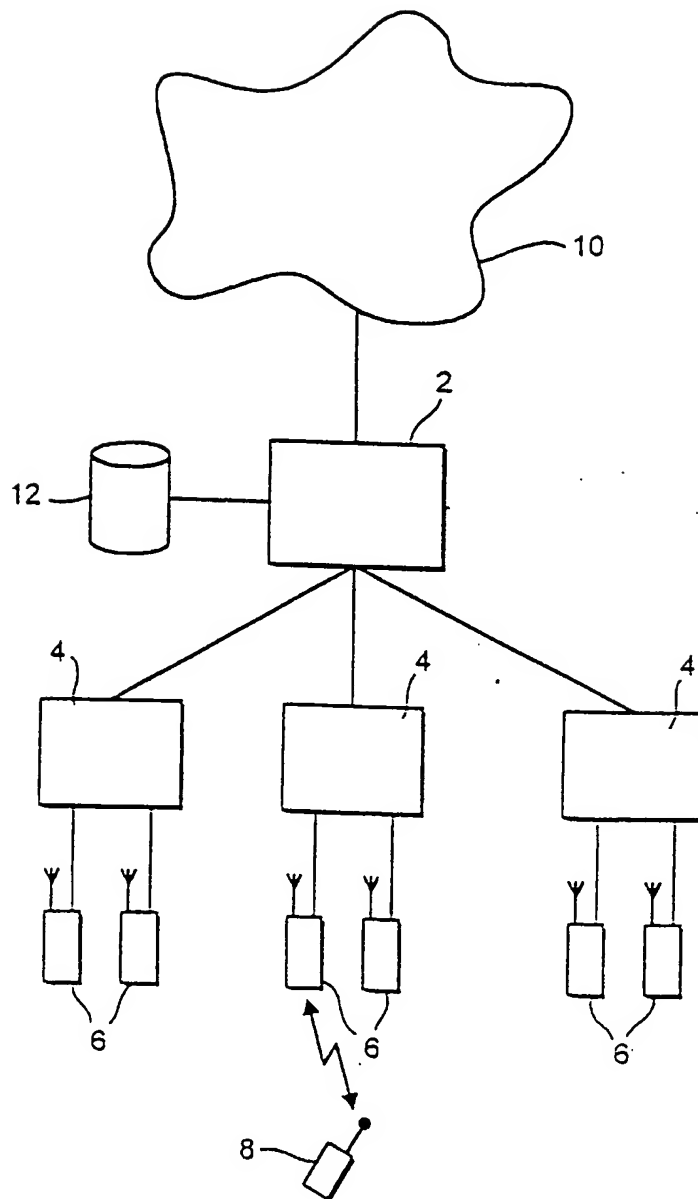


FIG. 1
PRIOR ART

Fig. 2A

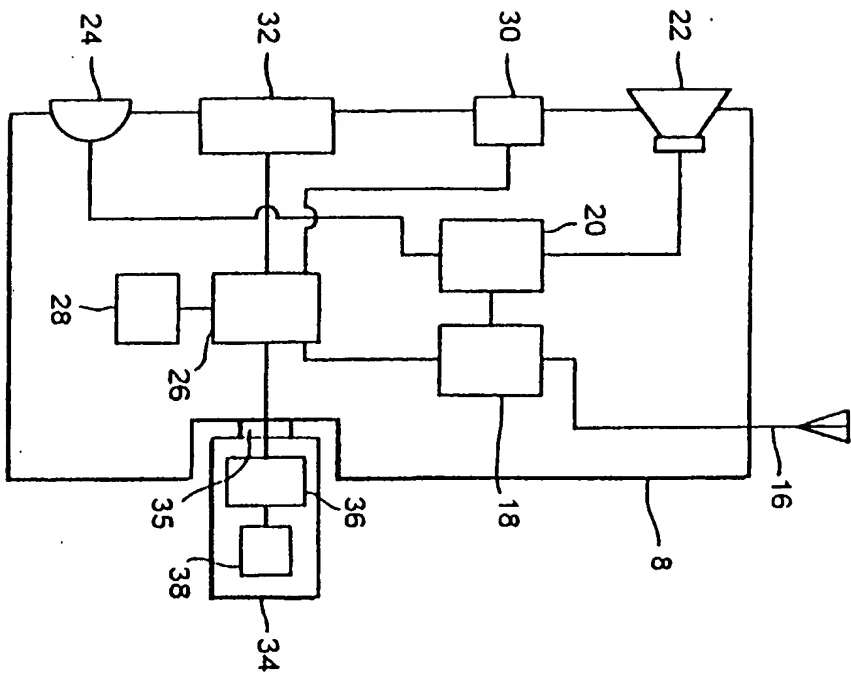
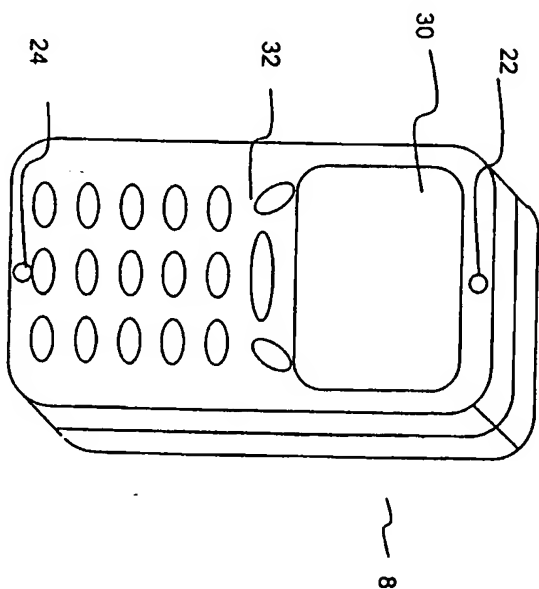


Fig. 2B



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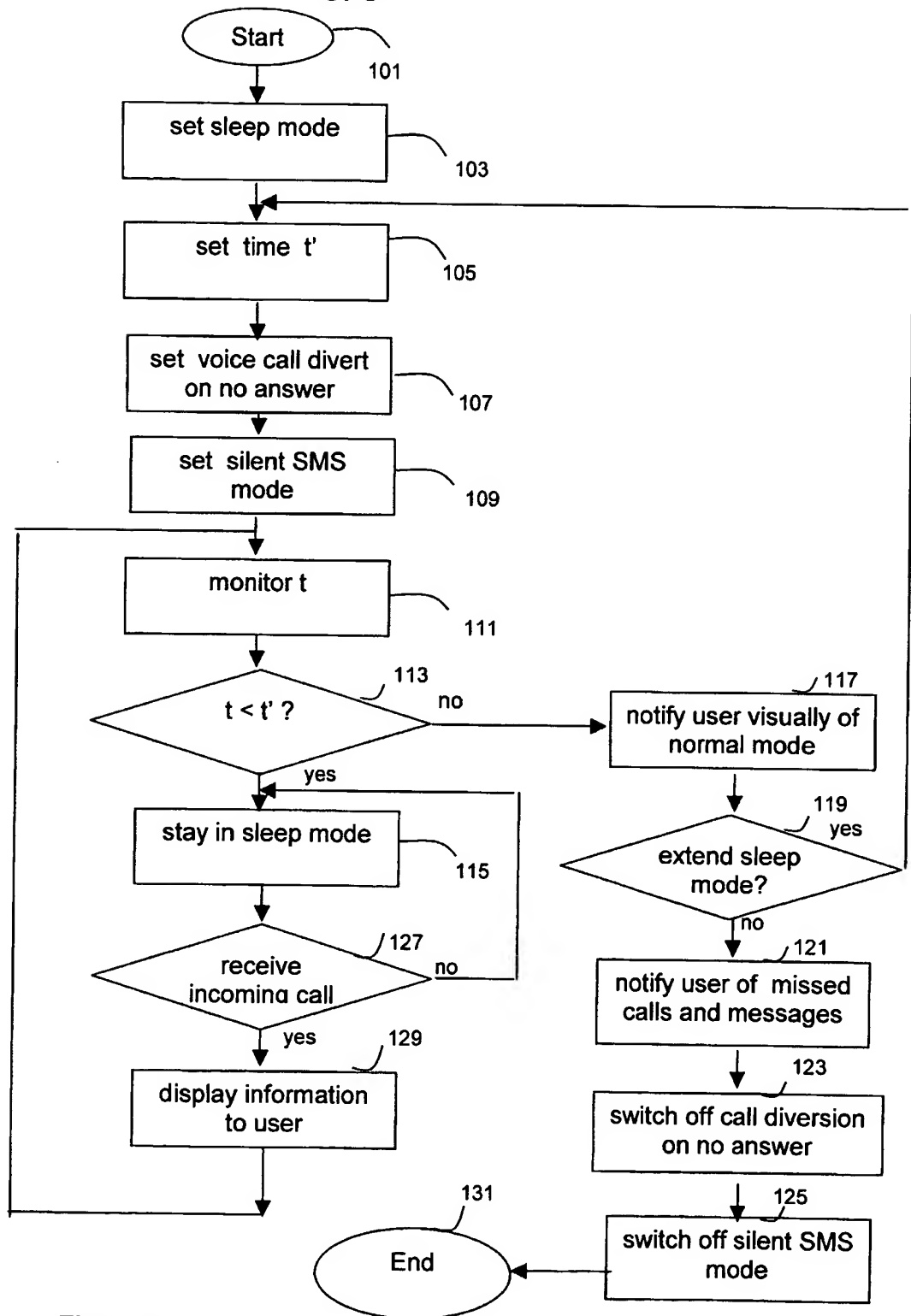


Fig. 3

4/6

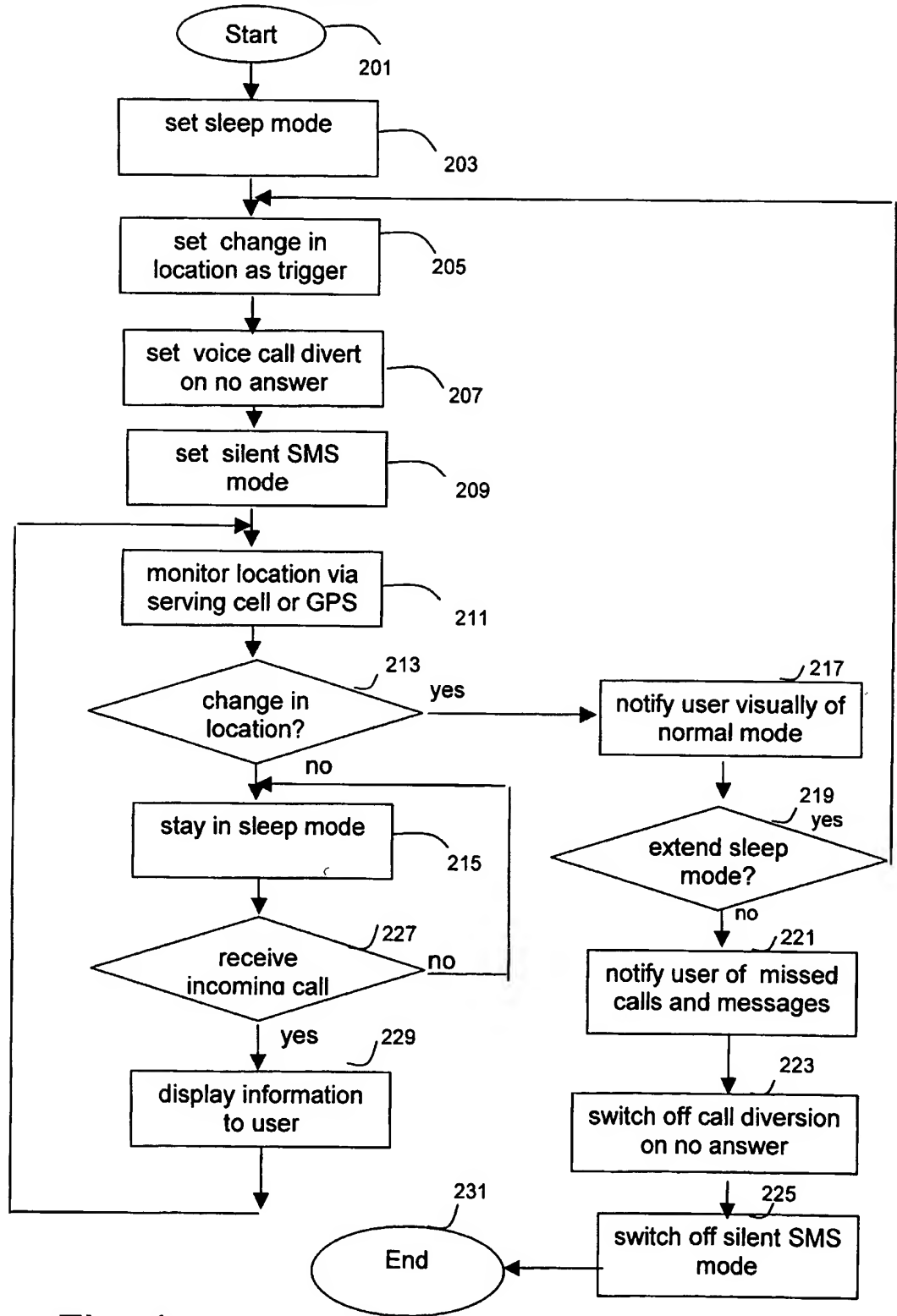


Fig. 4

please enter

time

location
other

to trigger return to
normal mode

Fig. 5A

set time trigger

time

time period

Fig. 5B

time to switch to
normal mode:

10	:	30
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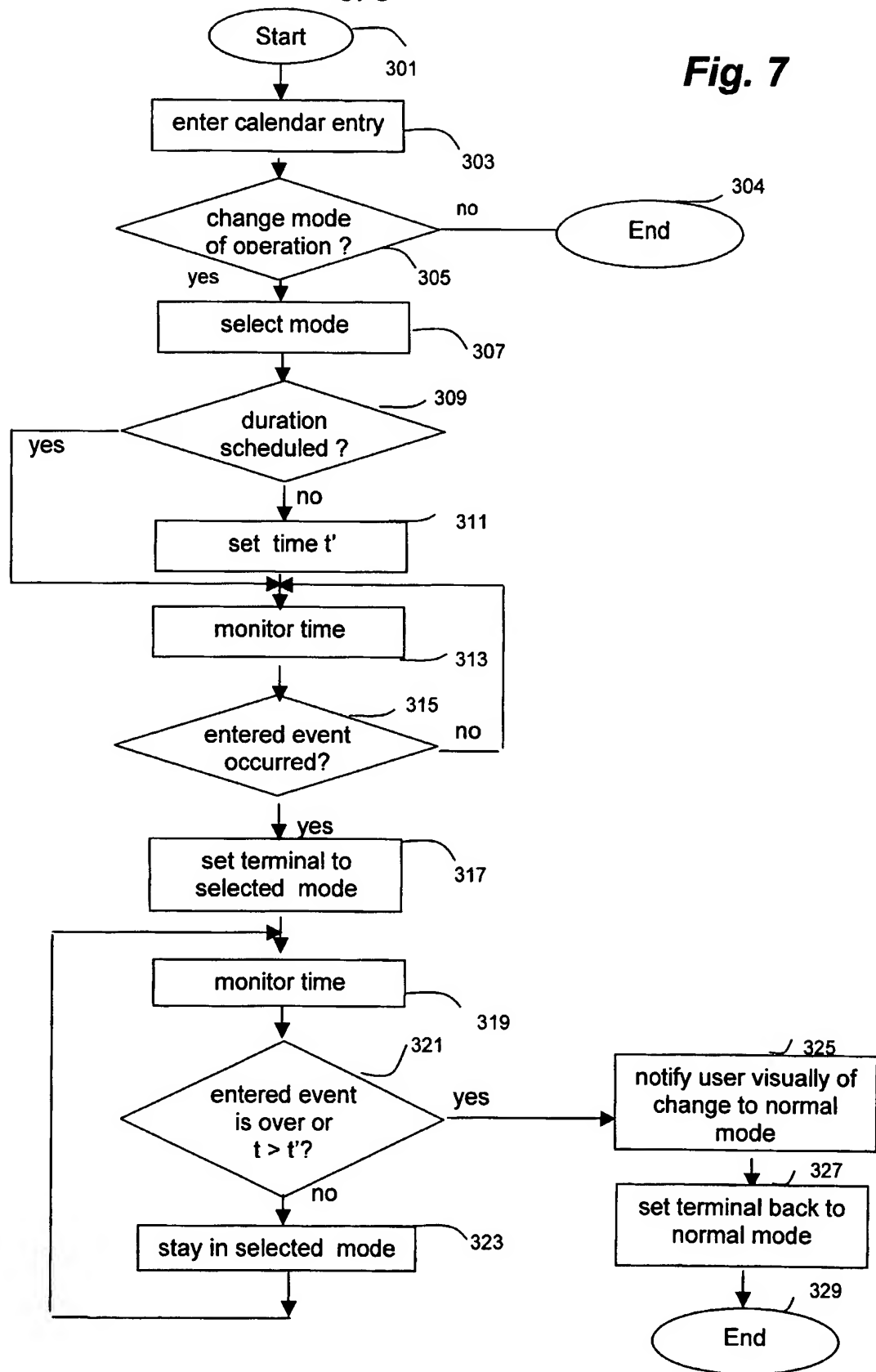
Fig. 5C

incoming call from

01234 56789

Fig. 6

Fig. 7



Mobile Communications

This invention relates to methods and systems of controlling a mobile terminal. More particularly, but not exclusively, the invention relates to
5 controlling a mobile terminal by defining a profile of an operation mode and switching from a particular mode of operation to another mode of operation.

There are a number of places or occasions where a user of a mobile terminal wants to set a number of different functions or settings such that the terminal is in a particular mode of operation. For example, the user may not
10 want the terminal to produce audible alerts, as the noise might disturb others. These places and occasions for example include theatres, cinemas, libraries, conferences or business meetings, and are referred to as Non-Mobile Friendly Events (NMFE) in the following.

For the duration of such a NMFE, the user could switch the mobile
15 terminal to a silent mode. In this case, information about incoming calls is recorded in the usual way. However, the disadvantage is that the user has to remember to switch off silent mode of the terminal after the NMFE. In addition, the calling parties might think that the user was simply not answering the call and might try to reach the user several times which is
20 tedious for the calling party and also leads to an unnecessary increase in signalling in the communications network.

In the Nokia 8310 mobile terminal by Nokia™ is described to have various setting groups to customise the mobile's alerting tones for different

events and environments. The phone tone setting groups can be activated via the menu functions. The user may for example select a phone tone setting group called "silent". The user may also set a setting group to be active for a certain amount of time up to 24 hours. After the time period set by the user expires, the previous setting group set becomes active again.

This option of having phone tone setting groups is very similar to switching manually to silent mode and the disadvantage remains that the calling parties are not informed that the user is currently unreachable.

The user can avoid this disadvantage by diverting all incoming calls to his voice mail box. However, in this case the user has to set the terminal manually and he has to remember to turn off call diversion after the NMFE. This would inform calling parties that the user is currently unavailable and at the same time prevent the terminal from ringing during the NMFE. However, messages received via the short message service (SMS) would still be notified audibly, unless the user switches to silent mode for SMS reception. If all calls are diverted to a voice mail box, then no signalling takes place between network and mobile, so then there is no indication of missed calls at the terminal. Information about the calls missed during the NMFE will not be recorded.

A further solution would be to switch off the mobile terminal for the duration of the NMFE. This would prevent the terminal from audibly alerting calls and SMS messages. The calling party would be notified that the user is currently not reachable and calls might be diverted to voice mail if the user

had set up his terminal accordingly. However, the user has no access to call information about the calls missed during the NMFE (apart from possibly the last incoming call via dialled operator services, such as the BT 1471 service). Another disadvantage is that the user will have to remember to switch on the terminal following the NMFE. Also the user usually receives an audible indication when the terminal is switched on, which might be disturbing, and the user might need to key in the personal identification number (PIN) before the terminal can be used.

In order to avoid the need to switch the terminal back on manually after the NMFE, the user may set the terminal to wake up at a particular time using the alarm function. However, the user may still need to key in the PIN before the terminal is usable. Moreover, if the NMFE takes longer than expected, the user is not able to change the specified time for wake-up without switching on the terminal and thus being disturbed by the audible indication when the terminal is switched on.

In US published patent application US 2002/0083028, a mobile terminal is described which operates automatically according to information pre-programmed by the user. The user defines certain time periods every day or week or periods dedicated to a particular event, and the terminal determines according to the information given for a particular event whether the user can be called during the scheduled time period for this event. If the terminal determines that the user cannot be alerted and a call is received, the terminal responds automatically to this call by sending a voice or SMS message to the

calling party notifying that the user is currently having a NMFE and that the user can be reached later.

A disadvantage of the described solution is that the user needs to preprogram the information about the events and in which way the user can be
5 alerted for each of the defined events. Another disadvantage is that additional signalling is required in order to notify the calling party that the user is currently not reachable.

In US patent application US2001/0009863, a method is described for restricting incoming calls in a mobile terminal. The user can specify a
10 particular time period in which the user does not want to receive any incoming calls. If a call is coming in, the terminal determines whether calls are restricted at that particular time by using the GSM call barring function to prevent the terminal from receiving any incoming calls. In this way call information is available and might be presented to the user after the NMFE
15 event. However, the user is usually still audibly alerted by the reception of SMS messages and the system is not very flexible.

It is an aim of the present invention to alleviate at least some of the disadvantages described and to provide an improved method and system for controlling a mobile terminal.

20 According to one aspect of the present invention, there is provided a mobile terminal for use in a mobile communications network, adapted to allow a user to define one or more new modes of operation, each mode of

operation comprising predefined network settings or a combination of network and terminal settings.

In this way the user can easily create new modes of operation and set the terminal to a desired mode of operation without the need to select each of the network or terminal settings separately. By providing user-predefined modes of operation which include network settings or a combination of network settings and terminal settings the user can select or define modes of operation with extended functionality and flexibility.

Preferably, the mobile terminal is further adapted to automatically initiate switching to and/or from one of said modes of operation after the terminal detects a predefined condition.

In this way the user may specify a particular condition, such as a time period, a particular time, a change in location or the occurrence or expiry of a selected calendar entry to initiate switching between different modes of operation. The user does not have to switch manually to or from a particular mode of operation. Instead, he may set a condition on which the terminal switches automatically between operation modes.

Preferably, the user may select an event out of a number of possible events to trigger switching between two different modes of operation. Such an event may for example be time information, location information, calendar information or a combination of those. The conditions to switch automatically between operation modes include for example a time period, a particular time, a change in location or the occurrence or expiry of a selected calendar entry to

initiate switching between different modes of operation. In this way there is provided a very flexible system to switch between different modes of operation.

According to another aspect of the present invention, there is provided
5 a method of operating a mobile terminal, comprising the steps of: i) defining one or more modes of operation, wherein each said mode of operation comprises predefined network settings or a combination of network settings and terminal settings.

Preferably, the method further comprised the step of ii) automatically
10 switching said terminal to or from one of said modes of operation.

According to another aspect of the present invention, there is provided a method of operating a mobile terminal for use in a mobile communication network, the method comprising the steps of pre-defining a plurality of modes of operation; and automatically switching between these modes according to
15 location information.

In this way a user may set a mobile terminal to switch between different modes of operation upon location information, such as upon detecting a change of location or upon detecting that the terminal is situated in a predetermined location.

20 According to another aspect of the present invention, there is provided a method of operating a mobile terminal for use in a mobile communication network, the method comprising the steps of pre-defining a plurality of modes of operation; and automatically switching between these modes according to

location information according to timing information stored in a user's calendar.

In this way the user can easily relate the information already stored in the mobile terminal's calendar to the functionality of switching between different profiles or modes of operation. The user does not need to program
5 the terminal for a particular NMFE if the event is already entered into the user's calendar.

According to another aspect of the present invention, there is provided a method of operating a mobile terminal for use in a mobile communications
10 network, the method comprising the steps of pre-defining a profile sleep mode comprising the settings "call diversion to a voice mail box on no answer", "silent mode for incoming calls" and "silent mode for short message reception"; and automatically switching to or from said profile sleep mode according to a condition selected or specified by the user of said terminal.

15 In this way a convenient way is provided for setting a terminal to a silent mode without losing information about incoming call and messages.

The call diversion function may for example be set to divert the incoming call to a voice mail box if no answer has been received within a specified time period, such as a period of 5 seconds. As the mobile is allowed
20 to be paged (albeit with no indication to the user) prior to the call being diverted, the information about the incoming call is accessible to the terminal.

Further aspects and advantages of the invention will be set out, by way of example only, from the following description and accompanying drawings, wherein:

Figure 1 is a general schematic outline of a GSM mobile communications network in which the present invention can be implemented;

Figure 2A is a block diagram of a mobile terminal for use in the network illustrated in Figure 1;

Figure 2B is a schematic illustration of the mobile terminal in figure 2A;

Figure 3 is a flowchart diagram illustrating the procedure of controlling a mobile terminal according to one embodiment of the present inventions.

Figure 4 is a flowchart diagram illustrating the procedure of controlling a mobile terminal according to another embodiment of the present inventions.

Figures 5A to C are schematic diagrams of display screens illustrating the procedure of controlling a mobile terminal according to yet another embodiment of the present invention.

Figure 6 is a schematic diagram of a display screen according to embodiments of the present invention.

Figure 7 is a flowchart diagram illustrating the procedure of controlling a mobile terminal according to another embodiment of the present invention.

In Figure 1 a schematic outline of a mobile telecommunications network according to the GSM standard is shown. A Mobile Switching Centre (MSC) is connected via communication links to a number of Base Station Controllers (BSCs) 4. The BSCs are dispersed geographically across areas served by the Mobile Switching Centre 2. Each BSC 4 controls one or more Base Transceiver Stations (BTSs) 6 located remote from, and connected by further communication links to, the BSC 4. Each BTS 6 transmits radio signals to, and receives signals from, mobile stations 8 which are in an area served by that BTS 6. The area is referred to as a "cell". A GSM network is provided with a large number of such cells, which are ideally contiguous to provide continuous coverage over the whole network territory.

A MSC 2 is also connected via communications links to other mobile switching centres in the remainder of the mobile communications network 10, and to a public service telephone network (PSTN), which is not illustrated.

It is appreciated that the invention may alternatively be implemented in other cellular networks, such as GPRS, UMTS or CDMA2000 networks.

Referring to Figure 2A and B, a mobile station 8 comprises a transmit/receive aerial 16, a radio frequency transceiver 18, a speech coder/decoder 20 connected to a loudspeaker 22 and a microphone 24, a processor circuit 26 and its associated memory 28, an LCD display 30 and a manual input port (keypad) 32. The mobile station is connected to a removable SIM 34 via electrical contacts 35.

The SIM 34 connected to the mobile station has a SIM processor 36 and SIM memory 38.

The SIM 34 is used for the storage and retrieval of data items by the processor 26 of the mobile station 8. The command set, data file structure and data coding formal for data communicated via the interface between the mobile station processor 26 and the SIM processor 36 are all specified, in the GSM system, in GSM technical specification 11.11 (3GPP TS 51.011 for release 4 onwards). In a similar manner, the Universal Subscriber Identity Module USIM is used in UMTS networks, see the Technical Specification 3GPP TS 31.102.

In the past, the SIM had a purely passive function and was used for storing data, mainly relating to the identification of a particular user, to authentication and security procedures.

Today, SIM cards have extended functionality and allow applications to be stored on the SIM card and interactions between the SIM card and the mobile equipment (ME). Such mechanisms can either be provided by the SIM application toolkit or by a SIM card, for which software can be written in a computer programming language such as JavaTM.

Referring now to Figure 3, the process of setting a mobile terminal to “sleep mode” is described. Sleep mode is a particular mode of operation, which allows a user to set the following settings on the mobile terminal: “call diversion to a voice mail box on no answer”, “silent mode for incoming calls” and “silent mode for short message reception”. The method also provides for

automatic switching to sleep mode according to a condition selected or specified by the user of said terminal.

The process starts in step 101 by the user wanting to set the mobile terminal to sleep mode. In order to activate sleep mode in step 103, the user
5 needs to press a predetermined key or a combination of keys on the terminal's keypad. The terminal then notifies the user via the display that the user needs to set a time t' at which the terminal switches off the sleep mode and re-enters the normal mode. The user enters the desired time t' in step 105 via the terminal's keypad. In steps 107 and 109 the terminal now enables the sleep
10 mode; In step 107 the terminal sets voice call diversion to a voice mail box if no answer is received after 5 seconds. In step 109 the terminal sets silent mode for calls and SMS reception.

In step 111, the terminal continuously monitors the current time in order to determine in step 113 whether the terminal is required to stay in sleep
15 mode (step 115) or whether the time t' has arrived for switching back from sleep mode to normal mode.

In the latter case, the terminal continues by notifying the user via the terminal's display that the terminal is about to switch off sleep mode in step 117. The terminal may further notify the user (step 119) that they can
20 extend the time period of the mobile terminal being in sleep mode by activating a predetermined key or a combination of keys. If the user decides in step 119 that the silent mode is required for an extended period, the process

continues in step 105 and the user can again set a new time t' at which the terminal switches back to normal mode.

If, on the other hand, the time period does not need to be extended in step 119, in step 121 the terminal displays to the user call information of any
5 calls which were received during the time period the terminal was set to sleep mode. The terminal also notifies the user of any received SMS messages.

In steps 123 and 125, the terminal disables the sleep mode by switching off the call diversion to the voice mail box on no answer (step 123), and by switching off the silent mode (for incoming calls and SMS) in
10 step 125. In step 131, the terminal is now again in normal mode.

If, in step 127, a voice call is received by the mobile terminal while being set to sleep mode, the call information like the calling party's identity is stored in the terminal as a missed call prior to the call being diverted. In step 129, the terminal displays this information to the user during sleep mode,
15 but no audible warning is given. The terminal may for example display a screen to the user as illustrated in Figure 6. Similarly, if in step 127 a SMS message is received, the user is visually notified of the event in step 129.

In this way the user is notified by the terminal of incoming calls or messages without being disturbed by the terminal alerting the user.

20 The terminal stores the call information of all calls received during sleep mode (see step 121) and displays the information to the user when switched back to normal mode. The user may also easily access the stored information and use it for returning the missed calls after the NMFE.

As an alternative to switching off the call diversion in step 123, the terminal may extend the time before a call is diverted if no answer is received, such as by changing the time period from 5 to 15 seconds, thus allowing more time for the user to answer incoming calls.

5 As an alternative to specifying a predetermined time t' at which the terminal automatically switches back to normal mode, the user may specify in step 105 a time period. In this case, the terminal monitors in step 113 whether the time period set by the user has expired and switches back to normal mode after the time period set by the user has expired.

10 Whilst it has been described that the terminal automatically switches from sleep mode back to normal mode after a specified time has occurred or a time period has expired, it is appreciated that alternatively the terminal may switch from normal mode to sleep mode according to a time condition pre-set by the terminal or by the user. The user may for example specify that silent
15 mode is to be set automatically after a certain time period expired.

It is appreciated that the user may at any time during sleep mode re-awake the terminal to switch it back to normal mode by activating a predetermined key or a combination of keys.

20 In this way the user may for example re-awaken the mobile terminal after the terminal informed the user of a received call by displaying the call information as described above with reference to Figure 6. The user may, for example, recognise from the information that an awaited call or a particular

important call was directed to the terminal and return the call after the terminal has been re-awaken.

In a similar manner, the user may at any time during sleep mode re-awaken the terminal for extending the sleep period.

5 According to another embodiment of the present invention, the user can specify a change in location to trigger the terminal to switch off the sleep mode and to return to normal mode.

Such an embodiment might be especially useful for events where the duration of time might be difficult to predict such as certain business
10 meetings, and where the user changes location after the event, for example leaves a conference or meeting after the event to go back to the user's office. For such an event, it is convenient to relate the automatic switching to or from sleep mode dependent on the mobile terminal's location.

Referring to Figure 4, we will now describe a process similar to that
15 described above with reference to Figure 3 but using a location trigger rather than a time trigger to switch from sleep mode to normal mode. Steps 201 and 203 are analogous to steps 101 and 103 described above. In step 205 the user defines that the terminal is to switch off the sleep mode when it has determined a change in location. Steps 207 and 209 are again analogous to
20 steps 107 and 109.

In step 211, the terminal monitors the location of the terminal. This can be done by using information from a global positioning system (GPS) or simply using information from which cell of the network the mobile is

currently provided services. This information is for example available from the location information elementary file on the SIM. As long as no change to the mobile's location occurs, the process continues with step 215 and 211 by staying in sleep mode and further monitoring the location. If a call or
5 message is received while the terminal is set to sleep mode (step 227), the terminal displays the all information to the user in step 229.

If the mobile determines in step 213 that its location has changed, the process continues in step 217. Again, steps 217 to 227 are analogous to step 117 to 127 described above.

10 Also in this embodiment the terminal may prompt the user to "extend" the sleep mode and to enter a new event to trigger the return to the normal mode. The user may for example set the terminal to sleep mode before attending a business meeting. However, the user might change location during the meeting without wanting the terminal to switch back to normal
15 mode. Thus, the user may after being prompted to do so in step 219, re-enter in step 205 that the terminal switches back to normal mode as soon as a further change in location is detected.

As an alternative to the time or location trigger described above, other events or a combination of events may trigger switching from sleep mode to
20 normal mode. The user may for example specify that the sleep mode is to be switched off after a selected time period has expired and a change in location is determined.

Instead of setting the trigger to a change in location, the user may also specify that the terminal switches back to normal mode if the terminal has determined that it is at a particular location, for example at the office or at home. In order to achieve this the user may define a particular cell as his
5 “home” or “office” cell if the user is at home or in the office. The terminal then memorises and stores the according information for that particular cell and refers to this information as the “home” or “office” cell.

According to a further embodiment, the user is presented with a display as illustrated in Figure 5A after the user has activated the sleep mode.
10 The user is prompted to enter or select a particular “event” to be used as a trigger for switching from sleep mode to normal mode as soon as this “event” occurs.

The user may for example choose between the listed options “time”, “location” or others. By activating the navigation keys of the terminal, the
15 user may select one of the options.

If the user selects the listed highlighted option “time” in Figure 5A, the terminal displays a screen as illustrated in Figure 5B. The user is again offered two options, i.e. either to set a time at which the terminal switches back from sleep mode or to set a time period during which the terminal stays
20 in sleep mode.

If the user selects to set a time in Figure 5B, a screen as illustrated in Figure 5C is subsequently presented to the user. The user may then enter the

hours and minutes of the desired time into the two predefined fields by using the terminal's keypad.

Although in the above described embodiments a sleep mode has been described to include a call diversion to a voice mail box on no answer, a silent
5 mode for incoming call and SMS reception and a visual notification of missed call information for incoming calls, it is appreciated that alternatively other predetermined modes of operation may be utilised. A similar sleep mode like the one described above may for example be achieved by replacing the call diversion function by a call barring function for all incoming calls.

10 More generally, the user may define "profiles" of operation modes according to the present invention. These profiles consist of several network settings or a combination of network settings and terminal settings. The user may define as many different modes of operation as he likes. Also, the user may define the modes of operation including as many settings as he likes. The
15 user is not restricted in the choice of the settings he may want to include in the defined modes of operation.

Terminal settings are functions which are set directly on the terminal, such as the volume of a ring tone, the type of alert etc. Network settings are implemented by the service provider. These functions include for example
20 call diversion, call barring, call holding, access to caller identity or cell identity information, etc.

By providing these predefined modes of operation, the user can switch easily between different modes of operations without requiring the user to set

these commands or functions individually. Also, an application running on the terminal or the SIM can make use of the predefined profiles to switch between them. Preferably, both the network and terminal settings are standard commands and/or settings. In this way the “profiles” can be
5 implemented easily into existing mobile terminals.

A further example for such a profile of an operation mode is a “noisy mode”. This mode is set up particularly for use in high noise environments, such as factory floors, airports, etc. In the noisy mode, the call and SMS indication tones are set to the maximum volume, vibration and visual alerting
10 modes are switched on in addition to the audible alerts, and call diversion to a voice mail box on no answer is switched off.

In this way the user is provided with a maximum of incoming call or message alerting. At the same time, the user has the maximum amount of time to answer an incoming voice call.

15 Other modes of operation include for example a “sales mode”, in which no information relating to outgoing calls is displayed, and call waiting and call divert on busy subscriber is disabled, a “business mode”, which includes the browser settings for connection to an office server and call forwarding to a secretary’s number on busy or no answer, or a “leisure mode”,
20 which enables the information about the caller identity to be displayed, sets a particular “fun” ring tone, and includes browser settings for connection to a personal internet service provider and e-mail.

Preferably, the terminal provides a number of predefined modes, such as the sleep mode and the noisy mode. However, the user can also create new modes or customise existing profiles. These modes may be defined either via the menu option by listing the desired settings or by setting the terminal manually to the desired mode of operation and subsequently defining this mode of operation as a profile. By defining a name access to the operation modes is facilitated.

As an alternative to using time or location information to initiate switching between different modes of operation, the user can set the terminal to use information entered to a calendar stored on the terminal to trigger the terminal to switch the terminal to a preferred mode of operation.

Many mobile terminals provide for a calendar option to store information about meetings or other events. A further embodiment of the present invention, in which the user may select a particular mode of operation for an event scheduled in the user's calendar will now be described with reference to the flowchart diagram of Figure 7.

In step 303, the user enters a new entry in his mobile terminal's calendar. In step 305, the user is presented with a screen asking whether a change in operation mode is required for the event entered into the calendar in step 303. If no change in operation mode is desired, the process ends in step 304. If the user wants to change the mode of operation for the time of the entered event, he may select a mode of operation in step 307. In order to facilitate the selection, the mobile terminal presents a screen with all the pre-

defined operation modes, such that the user can select the desired mode by operating the navigation and/or confirmation keys.

The terminal then checks in step 309 whether the entered event is scheduled in the calendar for a predetermined time period. If this is not the case, the user can set a time period t' for which the terminal will stay in the selected operation mode (step 311). If, on the other hand, the duration is already scheduled in the calendar, the process continues in step 313.

In step 313, the terminal monitors the time and compares the current time with the calendar entries. If, in step 315, the time for the entered entry arrives, the terminal is automatically set to the selected operation mode in step 317. Otherwise, the terminal keeps monitoring the time in step 313.

After the terminal is set to the selected mode in step 317, the terminal again monitors the time in step 319, in order to determine when the terminal is to be switched back to normal mode or the mode in which the terminal has been before switching to the selected mode in step 317. As long as the scheduled time for the end of the selected event has not yet arrived or the time period set in step 311 has not yet expired, the terminal stays in the selected mode (step 323) and keeps monitoring the time in step 319.

If the terminal determines in step 321 that the scheduled time period for the selected event is over or that the time period set in step 311 expired, the terminal notifies the user visually that its mode of operation is changed to normal mode (step 325). The terminal is switched back to normal mode in step 327 and the process ends in step 329.

The embodiments of the present invention are preferably implemented in the mobile terminal by means such as an application stored in the memory 28 of the mobile terminal 8, which is running on the terminal's processor 28. The application may for example be activated by the user when
5 he selects a particular mode of operation by pressing a predetermined key or combination of keys. If more than one profile is defined for a particular terminal, the user may access a menu for these profiles and select the desired profile via that menu.

As an alternative to storing and running the application for controlling
10 the terminal via a profile for a mode of operation on the processor of the mobile terminal, the application may be stored and run on the SIM, for example as a SIM Toolkit or a Java™ application.

It is appreciated that the all the features described above in the different embodiments of the present invention may be implemented
15 separately or in any possible combination.

It is to be understood that the embodiments described above are preferred embodiments only. Various features may be omitted, modified or substituted by equivalents, without departing from the scope of the present invention.

CLAIMS:

1. A mobile terminal for use in a mobile communications network, adapted to allow a user to define one or more new modes of operation, each mode of operation comprising predefined network settings or
5 a combination of network and terminal settings.

2. A mobile terminal according to claim 1, further being adapted to automatically initiate switching to or from one of said modes of operation after the terminal detects a predefined condition.
10

3. A mobile terminal according to claim 1 or 2, further being adapted to set or change said predefined condition.

4. A mobile terminal according to claim 1, 2 or 3 wherein said
15 condition includes the expiration of a predetermined time period.

5. A mobile terminal according to any of claims 1 to 4, wherein said condition includes the occurrence of a predetermined time.

20 6. A mobile terminal according to any of claim 1 to 5, wherein said condition includes a change in location of the mobile terminal.

7. A mobile terminal according to any of claims 1 to 6, wherein said condition includes the occurrence or the expiry of a calendar entry.

8. A mobile terminal according to any of claims 1 to 7, further
5 being adapted to change said predefined condition while set to said predefined mode of operation.

9. A mobile terminal according to any of claims 1 to 8, wherein said mode of operation is a sleep mode.

10

10. A mobile terminal according to claim 9, wherein said functions and settings comprise call diversion on no answer to a voice mail box.

11. A mobile terminal according to claims 9 or 10, wherein said
15 functions and settings comprise silent mode for SMS and incoming calls.

12. A mobile terminal according to any of claims 1 to 11, further being adapted to be switched to said other mode at any time while set to said predefined mode of operation.

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13. A mobile terminal according to any of claims 1 to 12, further being adapted to provide a plurality of different events for selection, said

events being used to set a condition relating to said events for switching to and/or from said predefined modes of operation.

14. A mobile terminal according to claim 13, wherein these events
5 comprise time events, location events or scheduled events.

15. A method of operating a mobile terminal, comprising the steps
of:

i) the user defining one or more modes of operation, wherein
10 each said mode of operation comprises predefined network settings or a
combination of network settings and terminal settings.

16. A method according to claim 15, further comprising the step of
ii) automatically switching said terminal to or from one of said
15 modes of operation.

17. A method according to claim 16, further comprising the step of
iii) defining a condition for initiating step ii).

18. A method according to claim 16 or 17, further comprising the
20 step of selecting an event related to said condition for initiating step ii).

19. A method according to claims 17 or 18, wherein said condition includes the expiration of a predetermined time period.

20. A method according to claims 17, 18 or 19, wherein said
5 condition includes the occurrence of a predetermined time.

21. A method according to any of claims 17 to 20, wherein said condition includes a change in location of the mobile terminal.

10 22. A method according to any of claims 17 to 21, wherein said condition includes the occurrence or expiry of a calendar entry.

23. A method according to any of claims 17 to 22, wherein a user of said terminal defines said conditions.

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24. An application for installation on a subscriber identity module for use in a mobile communications network, said application being adapted to perform the method of any of claims 15 to 23.

20 25. An application for installation on a mobile terminal for use in a mobile communications network, said application being adapted to perform the method of any of claims 15 to 23.

26. A method of operating a mobile terminal for use in a mobile communication network the method comprising the steps of:

- i) pre-defining a plurality of modes of operation; and
- ii) automatically switching between these modes according to location information.

27. A method of operating a mobile terminal for use in a mobile communication network the method comprising the steps of:

- i) pre-defining a plurality of modes of operation; and
- ii) automatically switching between these modes according to location information according to timing information stored in a user's calendar.

28. A method of operating a mobile terminal for use in a mobile communications network,

the method comprising the steps of:

- i) pre-defining a profile sleep mode comprising the settings:
 - call diversion to a voice mail box; and
 - silent mode for short message reception;
- ii) automatically switching to or from said profile sleep mode according to a condition selected or specified by the user of said terminal.

29. A method of operating a mobile terminal substantially as herein before described with reference to the accompanying drawings.



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INVESTOR IN PEOPLE

Application No: GB 0230062.2
Claims searched: 1-25

Examiner: Anita Keogh
Date of search: 17 June 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X	1-10, 12-23	GB 2323245 A	(NOKIA) see whole document, especially Tables 1-3
X	1, 2, 6, 15, 16, 21	GB 2372911 A	(ERICSSON) see pages 1-3 and Table 1
X	1-3, 6, 15-17, 21, 23 at least	GB 2363037 A	(NEC) see abstract and pages 12-15
X	1-6, 15-17, 19-21	GB 2358987 A	(ERICSSON) see whole document, especially figs 3 & 5
X	1-3, 5, 7, 10, 15-17, 20, 22, 23 at least	EP 1098489 A2	(NOKIA) see whole document, especially paragraphs 1-9 & 46, Table 1 and fig. 5
X	1-7, 13-23	US 2002/0142792 A1	(MARTINEZ) see whole document, especially abstract
X	1-5, 7-10, 12-20, 22, 23	GB 2375690 A	(MOTOROLA) see abstract and page 2 line 30 - page 3 line 25
X	1-5, 7, 9, 13-20, 22, 23	GB 2370196 A	(NEC) see whole document, especially figs 2, 3, 4, 7

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^v:

H4L

Worldwide search of patent documents classified in the following areas of the IPC⁷:



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INVESTOR IN PEOPLE

Application No: GB 0230062.2
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Date of search: 17 June 2003

H04M, H04Q

The following online and other databases have been used in the preparation of this search report:

Online: WPI, JAPIO, EPODOC



Application No: GB 0230062.2
Claims searched: 28

Examiner: Anita Keogh
Date of search: 10 December 2003

Patents Act 1977 : Further Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
Y	28	GB 2323245 A (NOKIA) see whole document, especially Tables 1-3
Y	28	GB 2375690 A (MOTOROLA) see abstract and page 2 line 30 - page 3 line 25
Y	28	WO 95/29568 A1 (ERICSSON) see abstract and page 15 lines 6-8
Y	28	EP 1098489 A2 (NOKIA) see whole document, especially paragraphs 1-9 & 46, Table 1 and fig. 5

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^v:

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